Check List 9(6): 1576–1579, 2013
© 2013 Check List and Authors
ISSN 1809-127X (available at *www.checklist.org.br*)

Check List
Journal of species lists and distribution

NOTES ON GEOGRAPHIC DISTRIBUTION

First report of four characiform fishes (Ostariophysi: Characiformes) for Uruguay

Wilson S. Serra [1,2*], Matías Zarucki [2], Alejandro Duarte [2], Edward D. Burress [3,4], Franco Teixeira-de-Mello [5], Iván González-Bergonzoni [5,6] and Marcelo Loureiro [2,1]

1 Museo Nacional de Historia Natural, Departamento de Zoología, Sección Ictiología. 25 de Mayo 582. CP. 11000. Montevideo, Uruguay.
2 Universidad de la República, Facultad de Ciencias, Departamento de Ecología y Evolución, Sección Zoología Vertebrados. Iguá 4225. CP 11400. Montevideo, Uruguay.
3 Appalachian State University, Biology Department. NC 28608. Boone, North Carolina, NC, USA
4 Current Address: Auburn Univeristy, Department of Biological Sciences. AL 36849. Auburn, Alabama, USA.
5 Universidad de la República, Facultad de Ciencias, Departamento de Ecología y Evolución, Grupo de Ecología y Rehabilitación de Sistemas Acuáticos. Tacuarembó entre Saravia y Bvar. Artigas. CP 20000. Maldonado, Maldonado, Uruguay.
6 Aarhus University, Department of Bioscience. Vejlsøvej 25, Silkeborg 8600, Denmark.
* Corresponding author. E-mail: *serraelbicho@gmail.com*

ABSTRACT: In this article the authors present the first report of four characiform fish species for Uruguay, extending their current distribution to the middle and lower Uruguay River basin: *Astyanax saguazu* Casciotta, Almirón and Azpelicueta, 2003; *Hypobrycon poi* Almirón, Casciotta, Azpelicueta and Cione, 2001; *Leporinus amae* Gody, 1980; *Cyphocharax saladensis* (Meinken, 1933). These species were previously recorded from either the upper Uruguay River, Patos-Merín lagoon system or Paraná River. Color pattern in life for *A. saguazu* and *H. poi* are described for the first time.

Recent taxonomic and revisionary work in ichthyological collections and field surveys of Uruguay, have resulted in the description of new species for science (e.g. González–Bergonzoni *et al*. 2010; Loureiro *et al*. 2011), new records for the country and confirmation of some doubtful records (Zarucki *et al*. 2010; Serra *et al*. 2011; Serra *et al*. 2012). In the present paper we present four new records of characiform fishes in Uruguay, with the first descriptions of color pattern in life (before fixation) for *Astyanax saguazu* and *Hypobrycon poi*.

Specimens are housed in the collection of Facultad de Ciencias (ZVC-P), Museo Nacional de Historia Natural de Montevideo (MHNM), Montevideo, Uruguay; Fundación Miguel Lillo (CI-FML), San Miguel de Tucumán, Argentina, and the Auburn University Museum (AUM), Alabama, USA. Identifications were based on original diagnoses or revisionary works. Measurements (nearest 0.1 mm) are straight-line distances taken with a digital caliper. Standard length (SL) is measured from tip of snout to hypural joint, and the head length (HL) does not include the opercular flap. When needed, specimens were cleared and counterstained (C&S) following Dingerkus and Uhler (1977).

Astyanax saguazu Casciotta, Almirón and Azpelicueta, 2003 (Figure 1):

Recorded specimens present all the diagnostic characters proposed by Casciotta, Almirón and Azpelicueta (2003): Two or three maxillary teeth, third or fourth tooth of outer premaxillary series inserted posteriorly to the rest, large eye (41-45% HL), first anal-fin ray inserted anterior to last dorsal-fin ray, iv-vi, 25-29 anal-fin rays, and 37-39 perforated scales in lateral line series.

Color in live specimens: body silver-gray with a horizontal silver midlateral stripe; pectoral fins yellowish, dorsal, adipose and pelvic fins yellow, anal fin yellow with anterior border reddish, and caudal fin yellow with outer rays reddish; humeral spot dark and vertically elongated; caudal peduncle spot black, extending into middle caudal fin rays; dorsal surface of head and body brownish, and upper region of iris dark red.

Specimens were collected in the middle and upper Cuareim River in Artigas Department, and in the upper Arapey River in Salto Department (Appendix 1 and Figure 5).

FIGURE 1. Live (ZVC-P 11585) and preserved (ZVC-P 11586) specimens of *A. saguazu*. Scale bar represent 1 cm. Photos by W. S. Serra.

Hypobrycon poi Almirón, Casciotta, Azpelicueta and Cione, 2001 (Figure 2):

Recorded specimens present the synapomorphic characters proposed for the genus by Silva and Malabarba (1996): dentary tooth anteriorly directed and inserted along the anterior margin of the bone; anterior tip of the dentary truncated forming an antero-dorsal bony

lamina, posterior to the posterior tooth insertion; and wide and shortened maxilla, enlarged where in contact with the premaxila. Morphometric data and color pattern in formalin preserved specimens partially overlap the known variation for *H. maromba* and *H. poi*, however, mouth position at lower orbital margin and presence of a vertically elongated humeral spot (sub-rounded only in a few exemplars), correspond to *H. poi*. The species was collected in three localities in northern Uruguay: Cuareim River in Artigas Department (middle Uruguay river basin), Tacuarembó Chico River in Tacuarembó Department (Negro River basin), and Queguay River in Paysandú Department (lower Uruguay River basin), (Appendix 1 and Figure 5).

Color in live specimens: Body silver-gray with a horizontal silver band and sky-blue highlights; pectoral fins hyaline, yellowish in the anterobasal portion, and with black chromatophores in the anterior and posterior margins of rays, conspicuous in the first ray; pelvic fins hyaline, white in the anterior margin; dorsal, adipose and caudal fins yellow; anal fin hyaline with dispersed black an red chromatophores, and anterior border white; humeral spot dark; spot in caudal fin base black, less conspicuous than specimens in alcohol, extending into middle caudal fin rays; dorsal surface of head and body yellowish, and upper region of iris dark.

Figure 2. Live and preserved (ZVC-P 11592) specimens of *H. poi*. Scale bar represent 1 cm. Photos by F. Teixeira de Mello (live specimen) and W. S. Serra (preserved specimen).

Leporinus amae Godoy, 1980 (Figure 3):

Recorded specimens present the characters proposed by Almirón *et al.* (2013). We found this species in three localities of middle and upper Cuareim River (Appendix 1 and Figure 5).

Color in live specimens: Color patterns in our specimens are the same as described by Almirón *et al.* (2013). In some of our specimens the yellow background in de body and the red color in cheeks, are more intense than the observed in specimens of the cited article.

Cyphocharax saladensis (Meinken, 1933) (Figure 4):

Specimens present the diagnostic characters proposed by Vari (1992) for the species: 27 to 30 scales in the longitudinal scale series including the lateral line, absence of longitudinal dark stripes or spots on the body, dorsal fin without dark pigmentation, and caudal peduncle with a patch of chromatophores, 13 or 14 pectoral fin rays, 8 or 9 perforated scales on lateral line, and body dept 39-43% of SL. Present records are from Cuareim River in Artigas Department, Negro River in Durazno Department and middle Uruguay River in Río Negro Department (Appendix 1 and Figure 5).

Color in live specimens: Color patterns in our specimens are similar to those described by Malabarba *et al.* (2013), though some specimens present a bright golden background color in the body.

The present records extend the known distribution of

Figure 3. Live and preserved (ZVC-P 11583) specimens of *L. amae*. Scale bar represent 1 cm. Photos by W. S. Serra.

Figure 4. Live (ZVC-P 11626) and preserved (ZVC-P 8489) specimen of *C. saladensis*. Scale bar represent 1 cm. Photos by W. S. Serra.

these four species, and are the first records in Uruguay. *Astyanax saguazu* and *Hypobrycon poi* were previously known as highly endemic from a small area of Misiones, Argentina (reported from only three and two localities, respectively), (Almirón *et al.* 2001; Casciotta *et al.* 2003; Chatellenaz 2007). However, the present records reveal a more extensive distribution range for both species. Similarly, *Leporinus amae* was known from the upper Uruguay River basin in the States of Santa Catarina and Rio Grande do Sul, Brazil (Godoy 1980; Hermes-Silva *et al.* 2009; Oliveira-Nuñer and Zaniboni-Filho 2009), and State of Misiones, Argentina (Almirón *et al.* 2013), and the

present record extends its distribution 450 km south to the middle Uruguay River basin. In contrast, *Cyphocharax saladensis*, is widely distributed in the la Plata River basin and Patos-Merín lagoon system, in Argentina, Brazil and Paraguay (Azpelicueta and Braga 1991; Vari 1992).

Considering their restricted distribution range in Uruguay (criteria in Soutullo *et al*. 2009), we argue that these species should be included in the list of prioritary species for conservation of the national wildlife protected areas system: SNAP (Sistema Nacional de Areas Protegidas) (see Soutullo *et al*. 2009). According to these and previous records (Zarucki *et al*. 2010; Serra *et al*. 2011) the Cuareim River basin seems to be the southernmost distribution of several species from the upper and middle Uruguay River Basin. Additionally, the Cuareim River supports an ecologically diverse and functionally important fish assemblage (Burress *et al*. 2012). Thus, conservation of this ichthyological diversity is important, especially because there are no protected wildlife areas in this basin. Particularly considering that the Cuareim River is being affected by an increasing agricultural activity, such as irrigation dams construction (ca. 402) that contribute to habitat fragmentation, coupled with high water demands that can exceed water availability in the basin (Collischonn *et al*. 2011). Given these poor environmental circumstances, the critical location of the basin along the middle Uruguay River, and the ecologically important fish assemblages, we judge that the Cuareim river drainage must be considered for the national conservation program.

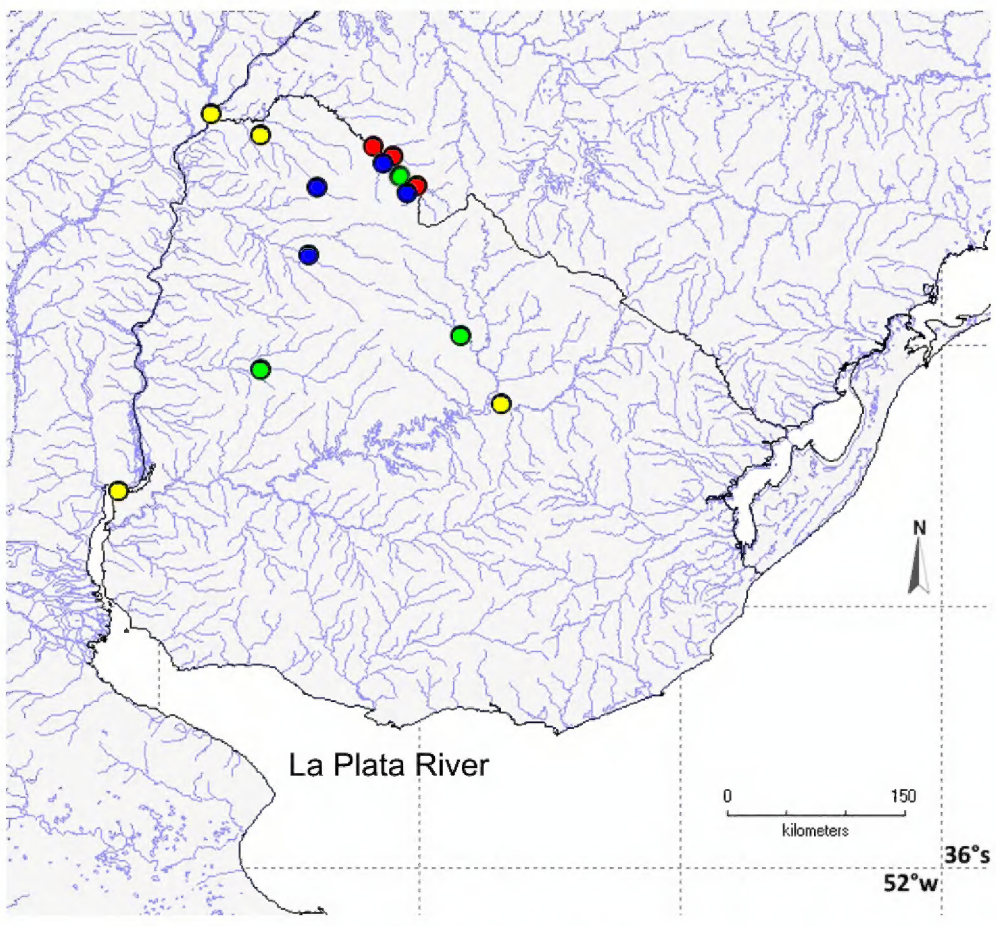

Figure 5. Distribution map of the recorded species: Blue dots = *A. saguazu*; Green dots = *H. poi*; Red dots = *L. amae*; Yellow dots = *C. saladensis*.

Acknowledgments: We are grateful to Jordan M. Holcomb and Federico Quintans for their assistance with fieldwork, and to Mr. Bergós for allowing us to work on his land. We thank Daniel Hernandez Huidobro and Fabrizio Scarabino for comments on the manuscript, Luiz Malabarba (UFRGS) for photographs of live specimens of *L. amae*, and Mercedes Azpelicueta (Museo de La Plata) for the copy of the description of *H. poi*. We also thank two anonymous reviewers that notoriously improved the manuscript. This article was partially funded by the Paul V. Loiselle Conservation Fund, Appalachian State University Office of Student Research grant, CSIC, and Programa de Desarrollo Tecnológico (Proyecto: 71/08). M.L. is funded by Sistema Nacional de Investigadores and PEDECIBA (Programa de desarrollo de las Ciencias Básicas).

Literature Cited

Almirón, A.E., J.R. Casciotta, M.M. Azpelicueta and A.L. Cione. 2001. A new species of *Hypobrycon* (Characiformes: Characidae) from Uruguay basin in Misiones, Argentina. *Neotrópica* 47: 33-40.

Almirón, A.E., J.R. Casciotta, M.C. Bruno, L. Piálek, K. Doubnerová and O. Říčan. 2013. First record and supplementary description of *Leporinus amae* Godoy, 1980 (Characiformes: Anostomidae) from freshwaters in Argentina. *Check List* 9(4): 820-822.

Azpelicueta, M.M. and L. Braga. 1991. Los curimátidos en Argentina. *In* Z.A. de Castellanos (ed.) *Fauna de Agua Dulce de la República Argentina*. La Plata: PROFADU-CONICET 40(1): 1-55.

Burress, E.D., A. Duarte, M.M. Gangloff and L. Siefferman. 2012. Isotopic trophic guild structure of a diverse subtropical South American fish community. *Ecology of Freshwater Fish* 22(1): 66-72.

Casciotta, J.R., A.E. Almirón and M.M. Azpelicueta. 2003. A new species of *Astyanax* from río Uruguay basin, Argentina (Characiformes, Characidae). *Ichthyological Explorations of Freshwaters* 14: 329-334.

Chatellenaz, M.L. 2007. Fauna asociada a comunidades de plantas reófilas en el Parque Provincial Moconá (Misiones, Argentina). *Facena* 23: 41-54.

Collischonn, B., R.C.D. Paiva, W. Collischonn, F.S.C. Meirelles, E.B.C. Schettini, and F.M. Fan. 2011. Modelagem hidrológica de uma bacia com uso intensivo de água: Caso do Rio Quaraí-RS. *Revista Brasileira de Recursos Hídricos* 16(4): 119-134.

Dingerkus, G. and L.D. Uhler. 1977. Differential staining of bone and cartilage in cleared and stained fish using alcian blue to stain cartilage and enzymes for clearing flesh. *Stain Technologies* 52: 229-232.

Hermes-Silva, S., D. Reynalte-Tataje and E. Zaniboni-Filho. 2009. Spatial and Temporal Distribution of Ichthyoplankton in the Upper Uruguay River, Brazil. *Brazilian Archives of Biology and Technology* 52(4): 933-944

Loureiro M., A. Duarte and M. Zarucki. 2011. A new species of *Austrolebias* Costa (Cyprinodontiformes: Rivulidae) from northeastern Uruguay, with comments on distribution patterns. *Neotropical Ichthyology* 9(2): 335-342.

Malabarba, L.R., P.C. Neto, V.A. Bertaco, T.P. Carvalho, J. Ferrer dos Santos and L.G.S. Artioli. 2013. *Guia de identificação dos peixes da bacia do rio Tramandaí*. Porto Alegre: Ed. Via Sapiens. 140 p.

Oliveira Nuñer, A. P. de and E. Zaniboni-Filho. 2009. Length–weight relationships of fish species caught in the Upper Uruguay River, Brazil. *Journal of Applied Ichthyology* 25(3): 362–364.

Serra ,W. S., A. Duarte, E.D. Burress and M. Loureiro. 2011. Perciformes, Cichlidae, *Crenicichla tendybaguassu* Lucena and Kullander, 1992: First record for Uruguay. *Check List* 7(3): 357-359.

Serra, W.S., A. Duarte, M. Zarucki, G. Fabiano and M. Loureiro. 2012. New records and distribution extension of *Potamorhina squamoralevis* (Braga & Azpelicueta, 1983) (Characiformes) and *Plagioscion ternetzi* Boulenger, 1895 (Perciformes) in Uruguay. *Boletín de la Sociedad Zoológica del Uruguay* 21(1-2): 65-69.

Silva, J.F.P. da and L.R. Malabarba. 1996. Description of a new species of *Hypobrycon* from the upper rio Uruguai, Brazil (Ostariophysi: Characidae). *Comunicações do Museu de Ciências e Tecnologia da PUCRS, Série Zoologia, Porto Alegre* 9: 45–53.

Soutullo, A., E. Alonso, D. Arrieta, R. Beyhaut, S. Carreira, C. Clavijo, J. Cravino, L. Delfino, G. Fabiano, C. Fagundez, F. Haretche, E. Marchesi, C. Passadore, M. Rivas, F. Scarabino, B. Sosa and N. Vidal. 2009. *Especies Prioritarias para la Conservación en Uruguay.* Montevideo: SNAP. Serie de Informes Nº 16. 95 p.

Vari, R.P. 1992. Systematics of the Neotropical characiform genus *Cyphocharax* Fowler (Pisces, Ostariophysi). *Smithsonian Contributions to Zoology* 529: 1–137.

Zarucki, M., I. Gonzalez-Bergonzoni, F. Teixeira-de Mello, A. Duarte, S. Serra, F. Quintans and M. Loureiro. 2010. New records of freshwater fish for Uruguay. *Check List* 6(2): 191-194.

Received: April 2013
Accepted: October 2013
Published online: December 2013
Editorial responsibility: Tiago Pinto Carvalho

Appendix 1. Museum records of species analyzed.
Astyanax saguazu: **CI-FML 5807**, 15 ex. (49.5-73.6 mm. SL.), 30°46' S, 56°02' W, Artigas Department, Uruguay, Col.: W.S. Serra, A. Duarte, M. Loureiro & L. Zigler, XII/2012; **MHNM 1063**, 7 ex. (47.8-63.6 mm. SL.), A° Sopas (31°18' S, 56°52' W), Salto Department, Uruguay, Col.: Dr. Zaldúa, 4/III/1962; **MHNM 3394**, 1 ex. (62.6 mm. SL.), A° Cuaró Grande (30°46' S, 56°46' W), Artigas Department, Uruguay, Col.: M. Loureiro, F. Teixeira, I. González & F. Quintans, II/2006; **MHNM 3425**, 16 ex. (45.2-78.8 mm. SL.), 30°46' S, 56°02' W, Artigas Department, Uruguay, Col.: W.S. Serra, A. Duarte, M. Loureiro & L. Zigler, XII/2012; **ZVC-P 9871**, 3 ex. (44.8-83.7

mm. SL.), A° Cuaró Grande (30°46' S, 56°46' W), Artigas Department, Uruguay, Col.: M. Loureiro, F. Teixeira, I. González & F. Quintans, II/2006; **ZVC-P 9933**, 2 ex. (78.1-79.9 mm. SL.), Picada del Negro Muerto (30°43' S, 56°06' W), Artigas Department, Uruguay, Col.: M. Loureiro, F. Teixeira, I. González & F. Quintans, II/2006; **ZVC-P 11585**, 2 ex. (56.7-60.8 mm. SL.), Cuareim River (30°46' S, 56°02' W), Artigas Department, Uruguay, Col.: W.S. Serra, A. Duarte, M. Loureiro, E.D. Burress & J. Holcomb, XI/2010; **ZVC-P 11586**, 3 ex. (61.7-75.4 mm. SL.), Cuareim River (30°42' S, 56°08' W), Artigas Department, Uruguay, Col.: W.S. Serra, A. Duarte, M. Loureiro, E.D. Burress & J.M. Holcomb, XI/2010; **ZVC-P 11627**, 17 ex. (44.1-81.8 mm. SL.), 30°46' S, 56°02' W, Artigas Department, Uruguay, Col.: W.S. Serra, A. Duarte, M. Loureiro & L. Zigler, XII/2012. ***Hypobrycon poi:*** **MHNM 3391**, 5 ex. (27.1-44.4 mm. SL.), Paso del Negro Muerto, Cuareim River (30°43' S, 56°06' W), Artigas Department, Uruguay, Col.: M. Loureiro, F. Teixeira, I. González & F. Quintans, II/2005. **ZVC-P 7802**, 3 ex. (41.6-54.6 mm. SL.), Tacuarembó Chico Stream (31°57' S, 55°40' W), Tacuarembó Department, Uruguay, Col.: F. Teixeira & I. González, III/2008; **ZVC-P 11592**, 68 ex. (19.9-60.1 mm. SL.), Paso del Negro Muerto, Cuareim River (30°43' S, 56°06' W), Artigas Department, Uruguay, Col.: M. Loureiro, F. Teixeira, I. González & F. Quintans, II/2005. **ZVC-P 11616**, 2 ex. (47.2-52.3 mm. SL.), Queguay River (32°10' S, 57°14' W), Paysandú Department, Uruguay, Col.: M. Loureiro, M. Zarucki, A. Duarte, J. Bessonart & D. Hernández, 2011. ***Leporinus amae:*** **MHNM 3393**, 1 ex. (91.8 mm. SL.), Cuareim River (30°46' S, 56°02' W), Artigas Department, Uruguay, Col.: W.S. Serra, A. Duarte, M. Loureiro, E.D. Burress & J.M. Holcomb, XI/2010; **AUM 58425,** 4 ex. (88.6-114.9 mm. SL.), Cuareim River (30°38' S, 56°10' W), Artigas Department, Uruguay, Col.: E.D. Burress, 7/III/2010; **AUM 58426**, 2 ex. (98.2-108.8 mm. SL.), Cuareim River (30°46' S, 56°02' W), Artigas Department, Uruguay, Col.: W.S. Serra, A. Duarte, M. Loureiro, E.D. Burress & J.M. Holcomb, XI/2010; **AUM 58427**, 1 ex. (112.6 mm. SL.), Cuareim River (30°42' S, 56°08' W), Artigas Department, Uruguay, Col.: W.S. Serra, A. Duarte, M. Loureiro, E.D. Burress & J.M. Holcomb, XI/2010; **ZVC-P 9356**, 1 ex. (90.2 mm. SL.), Cuareim River (30°38' S, 56°10' W), Artigas Department, Uruguay, Col.: A. Duarte, XII/2008; **ZVC-P 11583**, 2 ex. (81.0-92.1 mm. SL.), Cuareim River (30°46' S, 56°02' W), Artigas Department, Uruguay, Col.: W.S. Serra, A. Duarte, M. Loureiro, E.D. Burress & J.M. Holcomb, XI/2010; **ZVC-P 11584**, 1 ex. (105.4 mm. SL.), Cuareim River (30°42' S, 56°08' W), Artigas Department, Uruguay, Col.: W.S. Serra, A. Duarte, M. Loureiro, E.D. Burress & J.M. Holcomb, XI/2010; **ZVC-P 11628**, 1 ex. (85.3 mm. SL.), 30°46' S, 56°02' W, Artigas Department, Uruguay, Col.: W.S. Serra, A. Duarte, M. Loureiro & L. Zigler, XII/2012. ***Cyphocharax saladensis:*** **MHNM 3392,** 2 ex. (36.8-54.8 mm. SL.), Bella Unión (30°12' S, 57°37' W), Artigas Department, Uruguay, I/2009, Col.: M. Loureiro & M. Zarucki; **ZVC-P 10133,** 2 ex. (43.8-50.5 mm. SL.), Cuareim River (30°24' S, 57°13' W), Artigas Department, Uruguay, VIII/2006; **ZVC-P 8489,** 7 ex. (36.8-54.8 mm. SL.), Bella Unión (30°12' S, 57°37' W), Artigas Department, Uruguay, I/2009, Col.: M. Loureiro & M. Zarucki; **ZVC-P 11625,** 1 ex. (51.3 mm. SL.), Fray Bentos (33°07' S, 58°17' W), Río Negro Department, Uruguay, XI/2012, Col.: I. González, F. Teixeira, W.S. Serra, M. Masdeu, D. García, A. D'Anatro; **ZVC-P 11626,** 2 ex. (49.5-54.9 mm. SL.), Río Negro (32°26' S, 55°26' W), Durazno Department, Uruguay, I/2013, Col.: Wilson S. Serra, A. Duarte, J. Bessonart & M. Loureiro.